

Section 3 Uses of Minerals

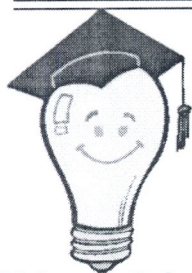
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- A. _____—rare and beautiful minerals that are highly prized
1. The Cullinan diamond and the Hope diamond are famous _____ gems.
 2. Gems have _____ applications in abrasives, lasers, and electronics.
- B. Minerals can contain other useful _____.
1. An _____ is a mineral or rock containing a substance that can be mined at a profit.
 2. Elements must be _____, or purified, from ores.
 3. Some elements dissolve in fluids, travel through weaknesses in rocks, and in those weaknesses form mineral deposits called _____ mineral deposits.
 4. _____ is a useful element derived from the minerals ilmenite and rutile.

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Section 3 Mineral Resources

- A. _____—deposits of useful minerals; metals are from _____, deposits in which a minerals exist in quantities large enough to be mined at a profit.
1. _____ factors such as supply and demand determine whether a mineral deposit is an ore.
 2. To extract a useful substance from an ore, it must be concentrated and _____, which uses energy; smelting is one method of refining some ores.
- B. _____ mineral resources—any mineral resources not used as fuels or as sources of metals, can be grouped into industrial minerals and building materials.
1. _____ include sandstone (for glass making), halite (for table and road salt), and garnet (for abrasive sandpaper).
 2. Nonmetal mineral resources used for _____ include aggregate (for concrete), gypsum (for plaster, wallboard), and stones (such as granite, limestone, and sandstone).
- C. _____ uses old materials to produce new ones and helps reduce demand for mineral resources, which are nonrenewable.



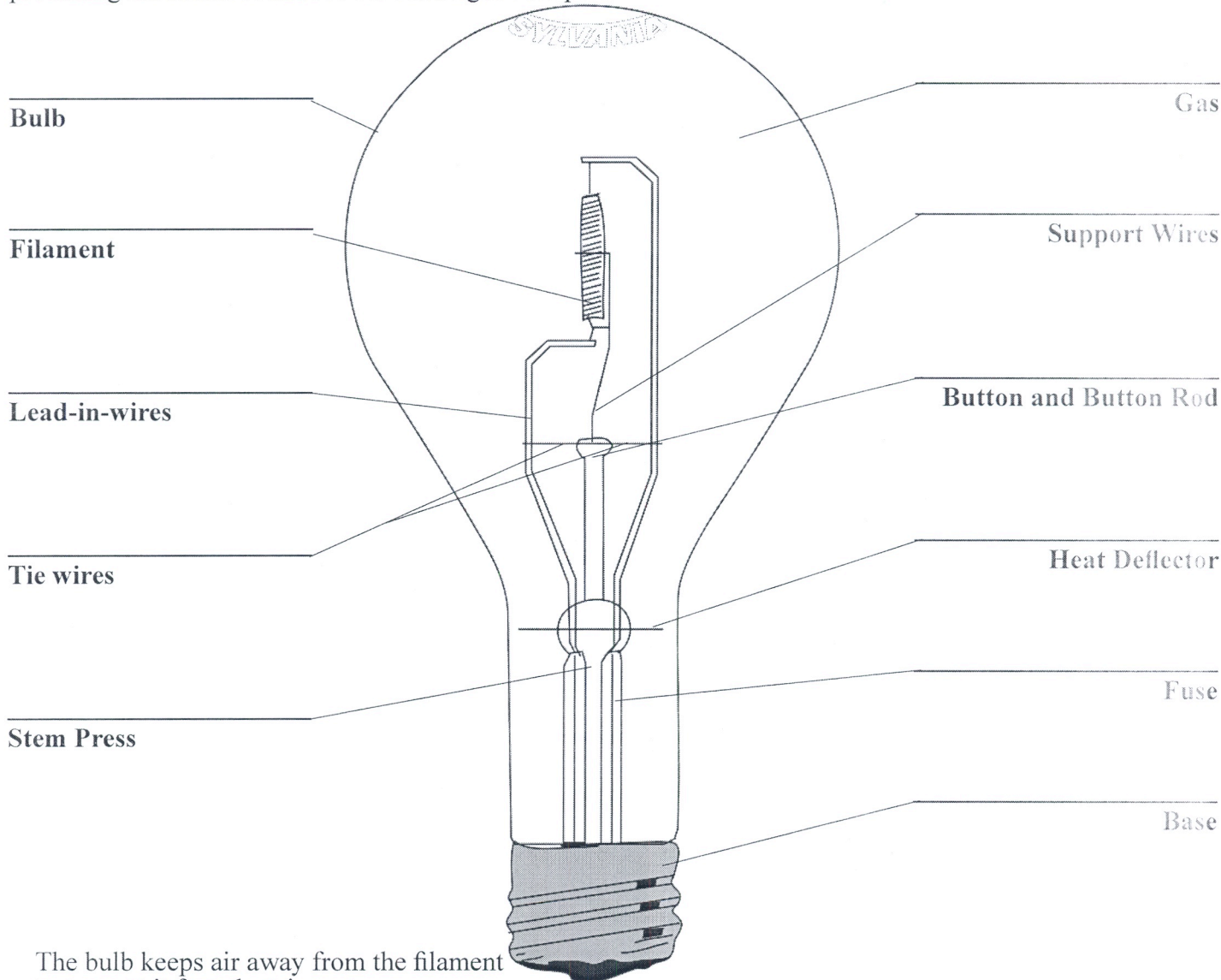
Knowledge is Enlightening

What's the purpose of the different parts
What minerals are they made of
Which countries produce the resources in a bulb

Parts from all over the world

Using the information from page 1, fill in the blanks by the light bulb with the name of the states or countries producing the resource needed for each light bulb part.

What do you think would happen if one of the parts was removed from the bulb?



The bulb keeps air away from the filament to prevent it from burning up.



Tungsten melts at about 6,100° F; most rocks melt at about 2,800° F.



Molybdenum is an extremely strong metal and has a high melting point.



Bauxite to make aluminum is not mined in North America.



The world supplies of soda ash are practically inexhaustible. Almost all U.S. trona comes from Wyoming.



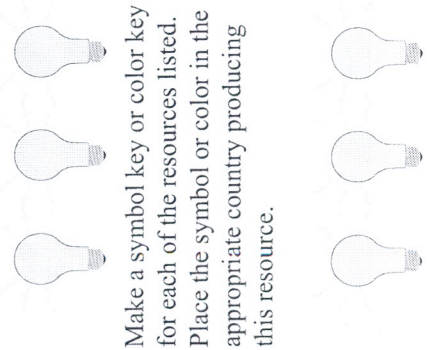
Copper is an excellent conductor of electricity and heat. Incandescent means *glowing with heat*.



Lithium, a metal, is also used in the glass to keep heat from turning it black.



Where In The World Are The Resources To Make A Light Bulb



Make a symbol key or color key for each of the resources listed. Place the symbol or color in the appropriate country producing this resource.

Raw Material
Silica (sand)
Limestone
Trona
Nitrogen
Argon
Manganese
Tungsten
Copper

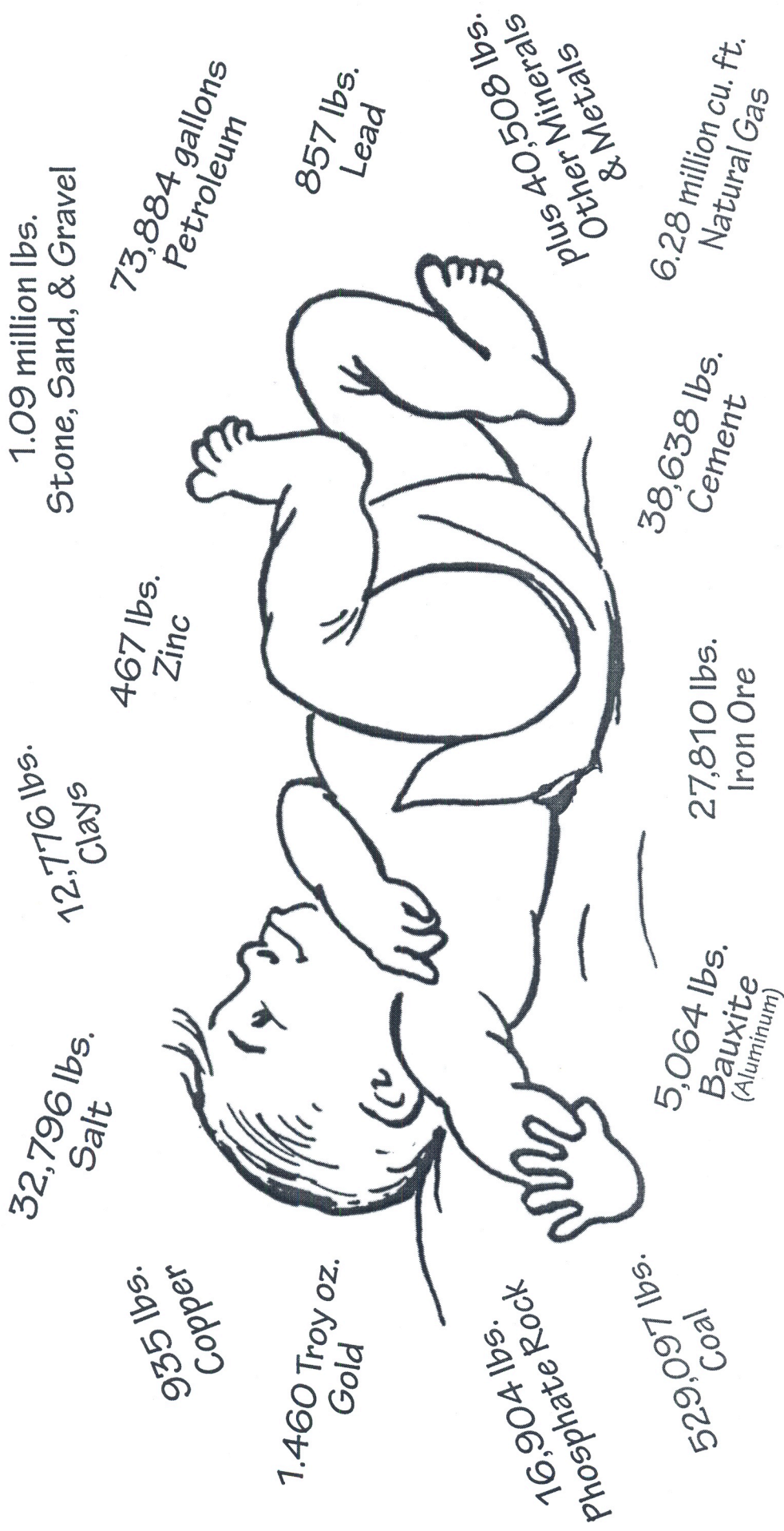
Major Countries Supplying the U.S.
USA—quarries throughout the U.S.
USA—numerous mines in the U.S.
USA—soda ash (85% from Wyoming)
USA—manufactured from liquid air
USA—manufactured from liquid air
Russia; South Africa; Gabon; China
China; Germany; Canada; Bolivia
Canada; USA; Chile; Peru; Mexico

Raw Material
Molybdenum
Aluminum
Zinc
Coal
Salt
Nickel
Lead

Countries Supplying the U.S.
USA; China; Chile; Canada
Australia; Guinea; Jamaica
Canada; Peru; Mexico
USA; Russia; China
USA; Canada; Chile
Canada; Australia; Russia
USA; Canada; Mexico

Russia is used for all former Soviet Union countries.
Source: USGS Mineral Commodity Summaries

Every American Born Will Need...



2.96 million pounds of minerals, metals, and fuels in their lifetime

Language Arts: Read "Ira Sleeps Over." Let students bring PJs & toothpaste.
Social Studies: What was used before toothpaste was "invented."

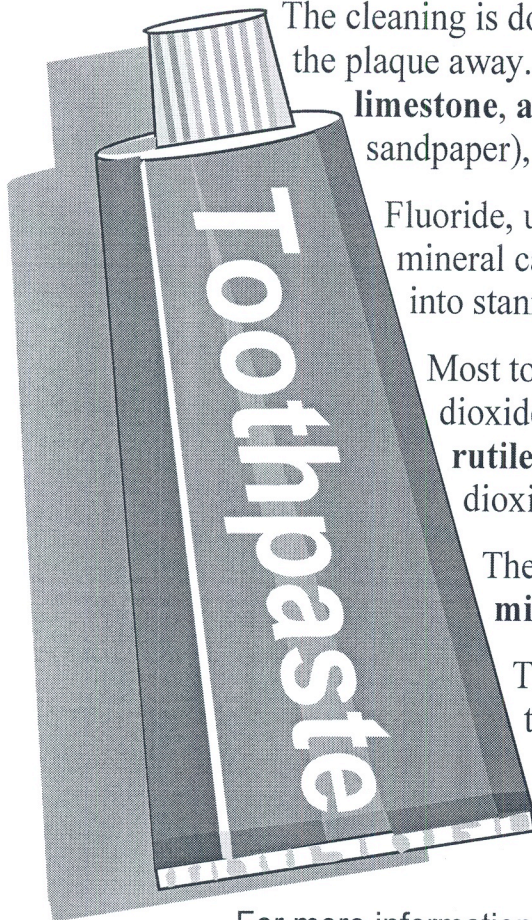


Dig A Little Deeper A Bright Smile



From Toothpaste and Minerals

Toothpaste cleans your teeth and keeps them healthy.



The cleaning is done with abrasives (from rocks) that rub the plaque away. Abrasives are minerals like **silica**, **limestone**, **aluminum** oxide (also used in sandpaper), and various **phosphate** minerals.

Fluoride, used to reduce cavities, comes from a mineral called **fluorite**. It is sometimes changed into stannous fluoride (**tin** fluoride).

Most toothpaste is made white with **titanium** dioxide which comes from minerals called **rutile**, **ilmenite**, and **anatase**. Titanium dioxide also is used to make white paint.

The sparkles in some toothpaste come from **mica**, a mineral common in many rocks.

The toothbrush and tube holding your toothpaste are both made of plastics that come from **petroleum** (petrochemicals) and other minerals.

For more information about minerals in society, go to:
 Mineral Information Institute, www.mii.org

Math: Survey class on brands used, chart or graph. **Health:** Discuss dental hygiene & special ingredients. **P.E.:** Stomp & squirt contest, use toothpaste & butcher paper.

Science: What minerals are found in toothpaste. Read about or research fluorite. Compare fluoride content in various brands.

(7 ACROSS), and various (2 DOWN).

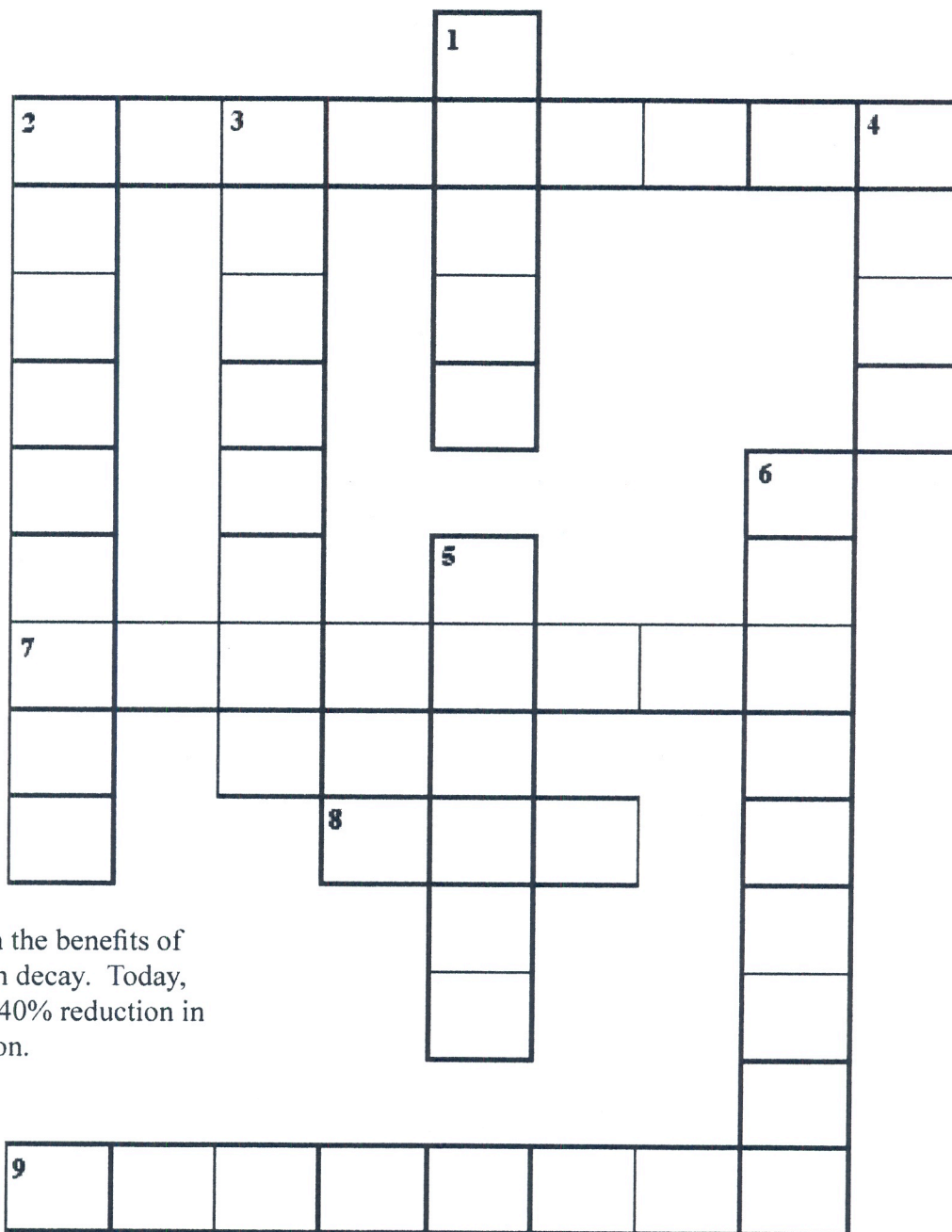
dioxide.

- (9 ACROSS), used to reduce cavities, comes from a mineral called fluorite.

- The sparkles in toothpaste come from the mineral (4 DOWN).

Rocks In Your Mouth

petroleum
aluminum
phosphate
limestone
titanium
fluoride
rocks
silica
mica
tin



In 1945, research began on the benefits of fluoride in preventing tooth decay. Today, researchers attribute a 15-40% reduction in cavities to water fluoridation.

Worldwide about 70 tons of gold is used each year in dental restorations for crowns, bridges and inlays. Gold is the oldest dental restorative material, having been used for dental repairs for more than 4000 years and is considered by many experts to be the best available material. A typical crown may contain between 62% and 78% gold.

Source: World Gold Council